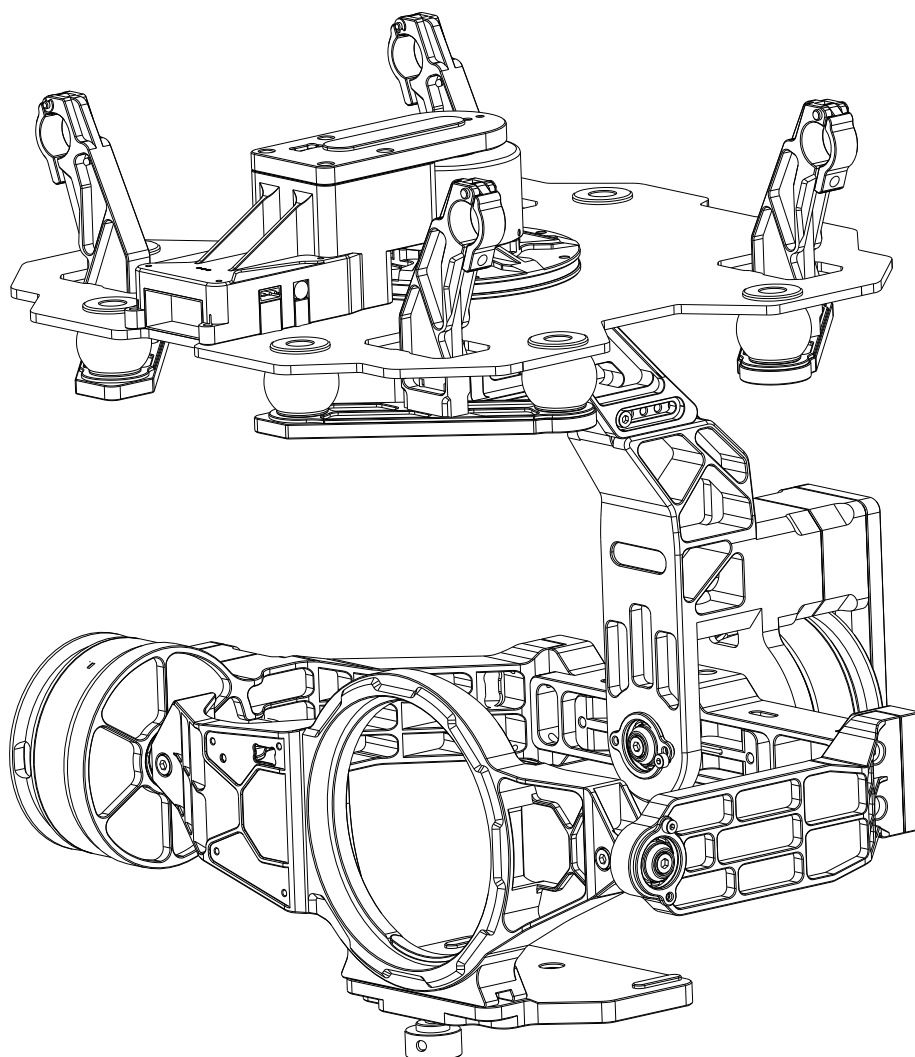


TAROT

TX-5D

V1.00

2015.3.16 User Manual



Thanks for your purchase of Tarot professional aerial photography products .
To ensure your success with this product, we would like to introduce the following information and important notes , hope it can be useful for you .

Contents

Warning and Disclaimer	2
Product Introduction	3
A. Product List	4
1. Package Contents	4
2. Self-prepared	4
B. Mounting and Configuration.	5
1. Camera Setup	5
2. Gimbal Mounting	6-7
3. Camera Connection and Camera Control	8
4. Video Signal Transmission.	9
5. Gimbal Controller Connection	10
6. Gimbal Working Mode.	11-12
C. Flight Test.	13
D. ZYX-5D Assistant Software	14
1. Drive & PC Assistant Software Installation and Setup	14
2. Introduction	14
3. Basic Setup	15
4. Channel Descriptions	16
5. Tools	17
6. Firmware Upgrade	17
E. Troubleshooting	18
F. Specifications.	19
G. Port Descriptions.	20
H. LED Indicator.	21

Warning and Disclaimer

Please DO NOT adjust the gimbal or change its mechanical structure!

Before leaving the factory, ZYX-5D gimbal has been adjusted to fit the camera and lens. Based on the setup procedures, you can achieve a fabulous flight experience. Please do not adjust the gimbal or change its mechanical structure. Moreover, do not add any component, such as a filter or lens hood, to the camera. It is highly suggested to apply to the original battery to avoid malfunctions of internal wirings or performance degradations.

In order to ensure the safety of flight control system after powering up, we recommend you to remove all the propellers and use non-power-supply for the gimbal. Keep the entire components far from children!

Because we have no control of the use, mounting, assembly and modification processes, TAROT will not assume any legal responsibility for the injury or damage.

Specified Camera and Lens:

Camera: Canon 5D MARK III

Lens: Canon EF 17-40mm f/4L USM



The state intellectual property has been awarded the TAROT model.,ltd five patents. Any units or individual without the license holder manufacture、copy、use and sale the product will be patent lawsuit.

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专利号patent number : 2014201546579

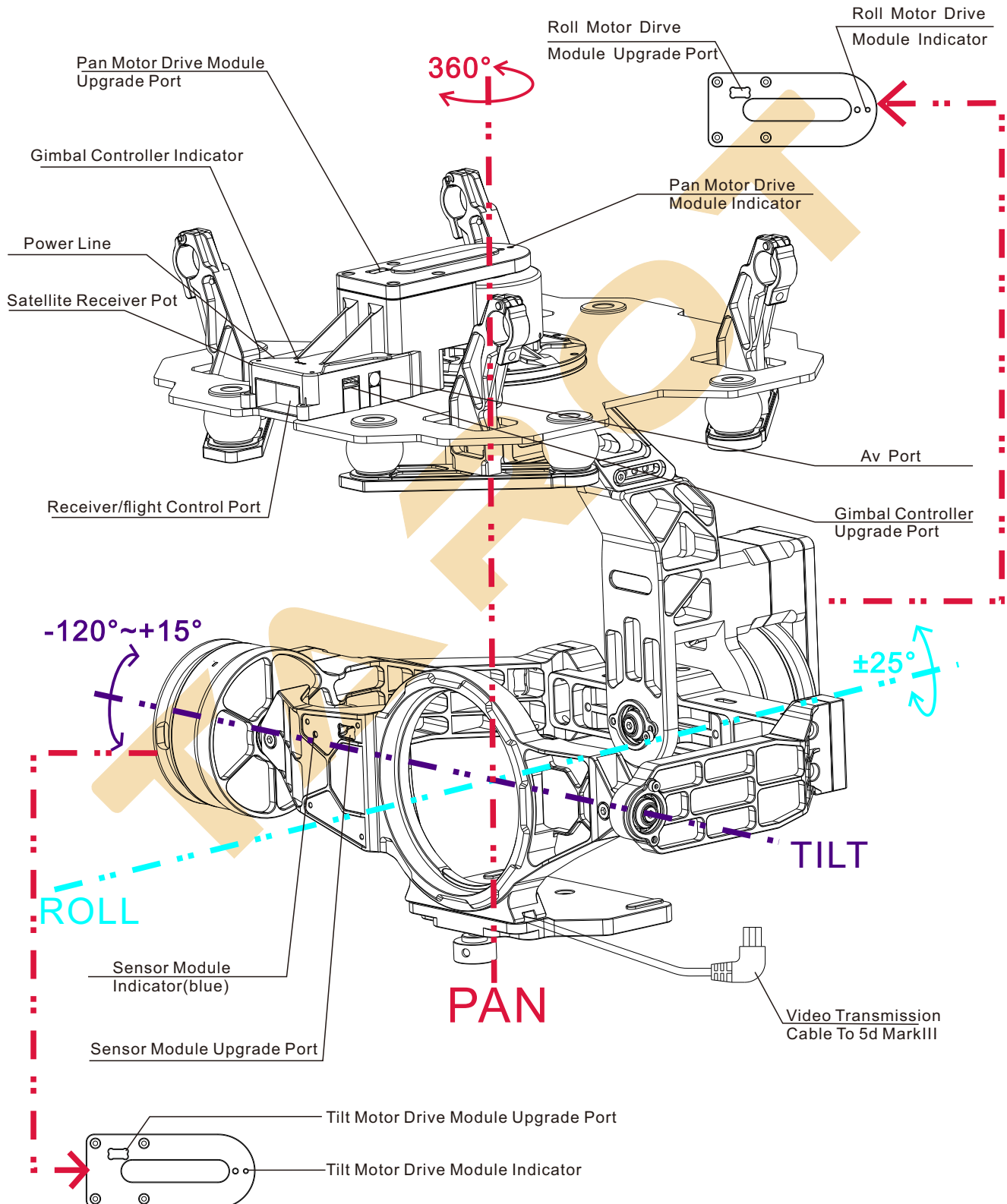
专利号patent number : 2014201546583

专利号patent number : 2014201546598

专利号patent number : 2014300741581

Product Introduction

ZYX-5D, a great gimbal for model aircraft enthusiasts, can be widely applied to various model aircraft activities and entertainments. With unique internal wiring design, built-in IMU gimbal control module, specialized servo drive module, this gimbal is able to support three working modes, including Attitude Lock(AL) mode, Pan Follow (PF) mode and First Person View (FPV) mode.

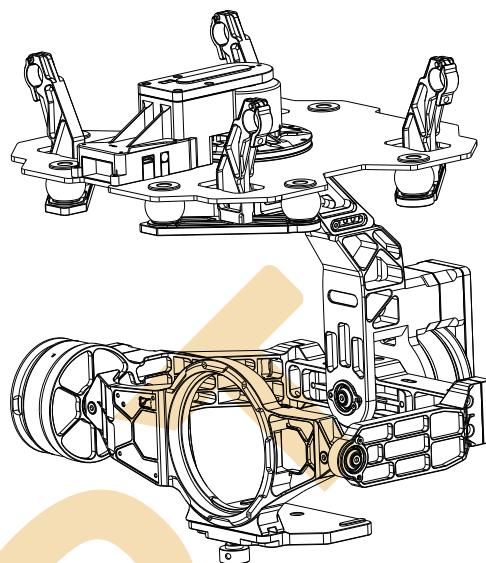


A.Product List

1. Package Contents

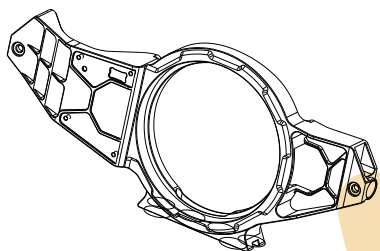
Gimbal*1

With unique internal wiring design, built-in IMU gimbal control module, specialized servo drive module, this gimbal is able to support three working modes, including Attitude Lock (AL) mode, Pan Follow (PF) mode and First Person View(FPV) mode.

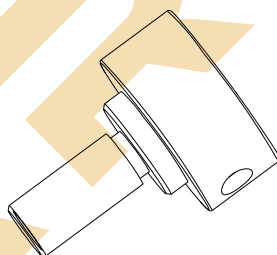


Main Components Pack

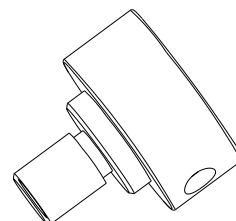
Lens RetainingPlate*1



Lens RetainingScrew*



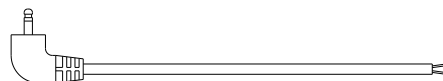
Camera Mounting Screws*



Video Transmission Cable*1



AV Cable*1



Gimbal to Flight Control Cable



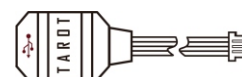
USB Cable*1



Cable *5



USB module *1



2. Self-prepared

Canon 5D MARK III Camera*1, Canon EF 17-40mm f/4L USM Lens*1
Multi-rotor*1, RX/TX.

B. Mounting and Configuration

1. Camera Setup

- ① Set your camera to Tv (Shutter-Priority AE) or M (Manual Exposure).
- ② Turn  (Live View shooting/Movie shooting Switch) to  (Live View).
- ③ Press the button "AF.DRIVE", set the drive mode to  (2-sec-self.timer/remotecontrol) or  (10-sec-self.timer/remote control).

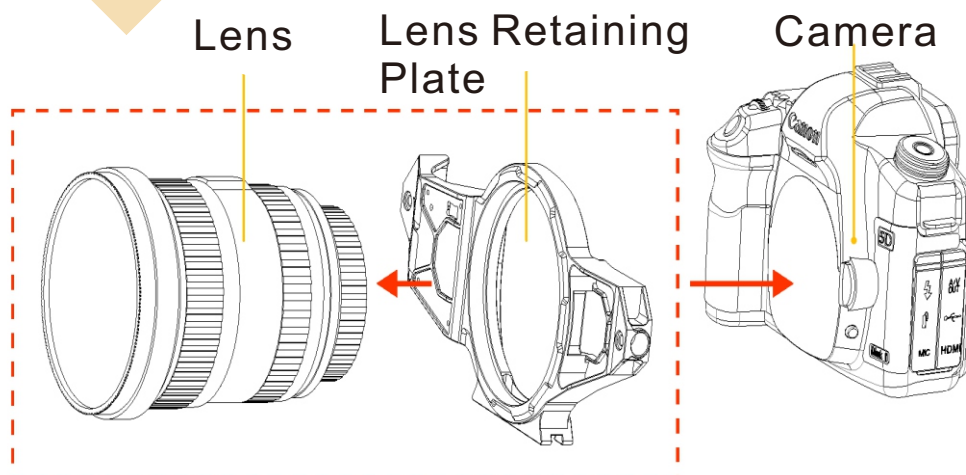
TIPs:

- ① In Manual Exposure, please set the ISO to Auto.
- ② Please adjust the shutter speed between 1/100 and 1/30 seconds. With manual exposure, please adjust the aperture to your preferences and set ISO to A.

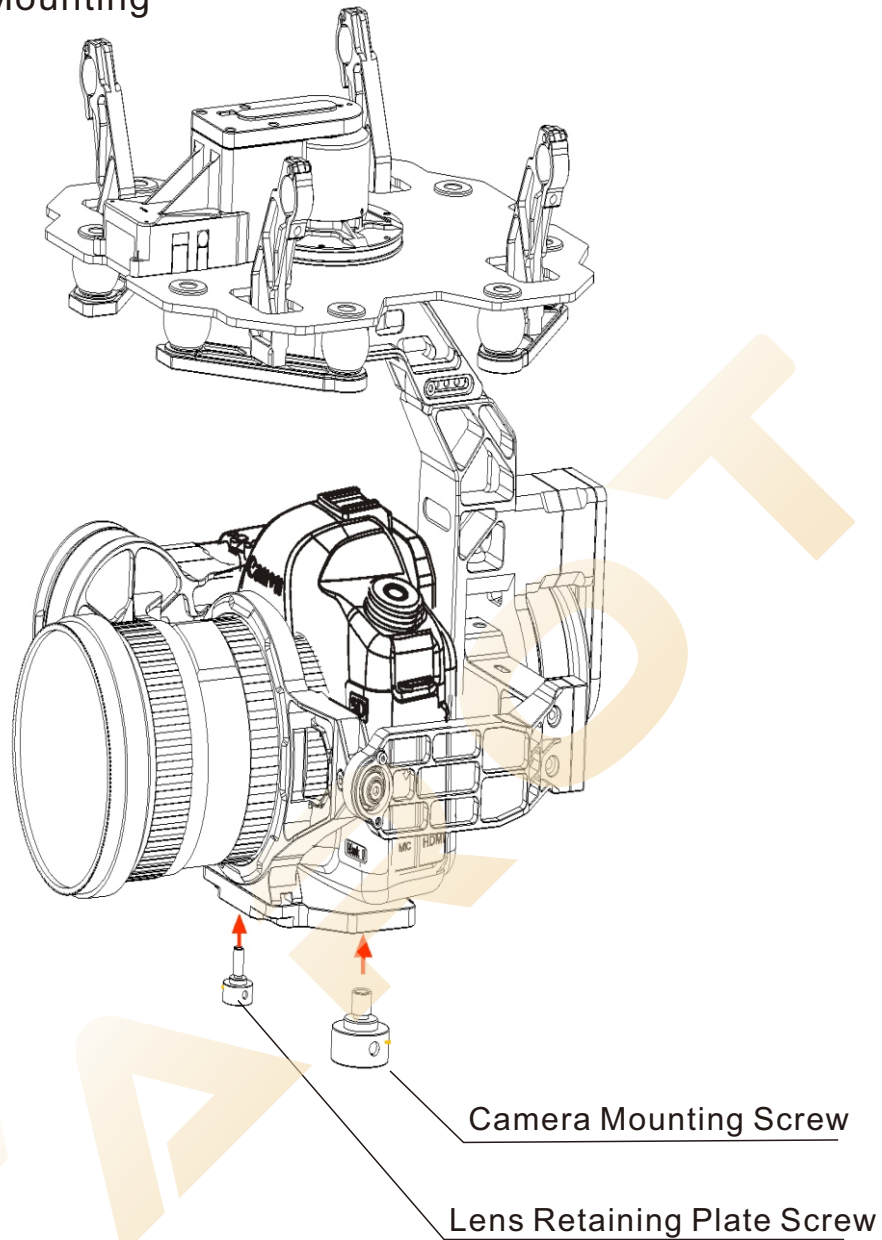
2. Gimbal Mounting

(1) Lens Mounting

Please mount the lens into the fixing ring, and then mount the lens onto the camera.



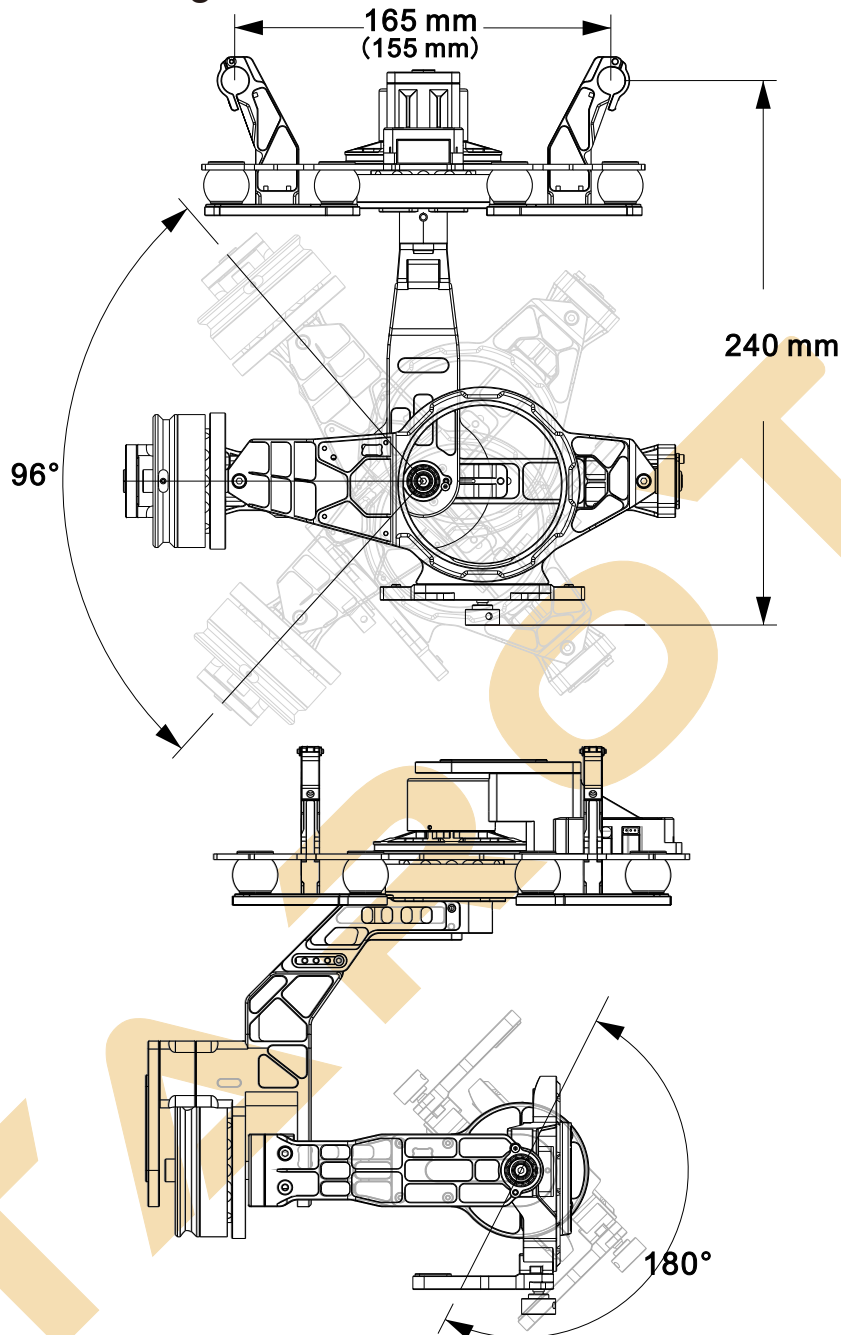
(2) Camera Mounting



- ① Mount the camera into the gimbal.
- ② Tighten up the camera mounting screw.
- ③ Tighten up the lens retaining plate screw.

Attention: Please screw down both screws, otherwise vibrations might occur.

(3) Gimbal Mounting



Mount the gimbal onto the landing gear. With some thread locker, tighten the mount screws.

TIPs:

- ① Please **DO NOT** remove any screw in the gimbal during mounting.
- ② We have correctly adjusted the center of gravity of the gimbal. Please **DO NOT** change it based on your preference.
- ③ The controller module with pin-port side should face to the head of the multi-rotor.
- ④ When mounting the gimbal and landing gear, please ensure all the dampen components are paralleled and undamaged.
- ⑤ Please make sure all the wirings are correct.

3.Camera Connection and Camera Control

Camera Connection

ZYX-5D gimbal is able to transfer the transmitter signal to infrared signal. Please ensure the connection and setup between camera and gimbal are correct.

Connect the gimbal video transmission cable to the A/V OUT/DIGITAL port of the camera.

Attentions:

Ensure that you have set the drive mode to  **(2-sec-self.timer/remote control)** or  **(10-sec-self.timer/remote control)**.

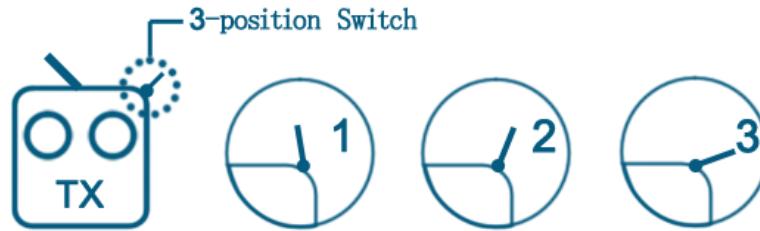
Camera Control

ZYX-5D gimbal is able to transfer the transmitter signal to camera control signal. You can achieve remote shutter control through a switch on the transmitter.

No matter which switch you have chosen, please ensure the connection between receiver and **PVC** channel of gimbal controller. Toggle the switch once, the camera will take a photo or start recording.

PHOTOS	
Position 2→Position 1	Take a photo
Position 1→Position 2	Centered (no action)
Position 2→Position 1	Take another photo

RECORDING	
Position 2→Position 3	Start recording
Position 3→Position 2	centered (no action)
Position 2→Position 3	Stop recording

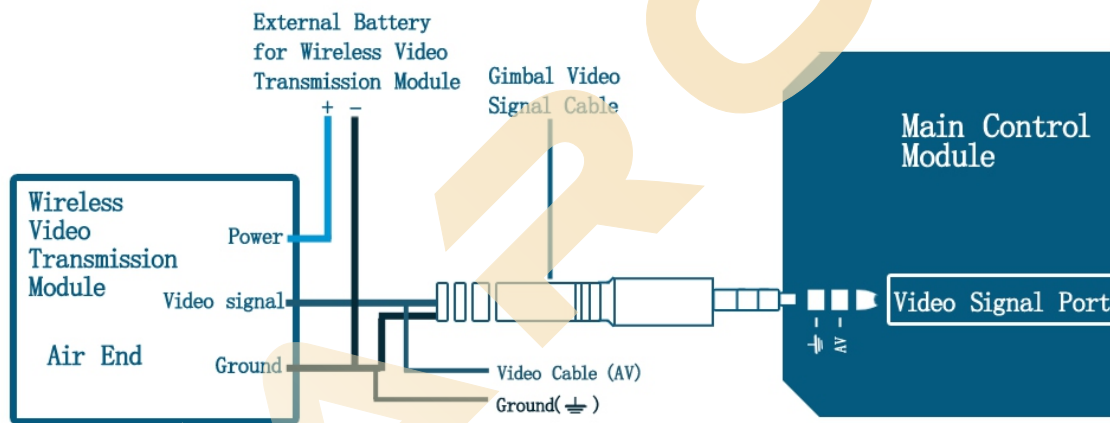


Attentions:

If you want to control the camera through a 2-position switch. Please set your transmitter and observe the cursor of PVC channel in the assistant software. Either taking-photos or recording can be applied in this circumstance.

4. Video Signal Transmission

You should prepare a wireless video transmission module and connect the cables according to the diagram below.



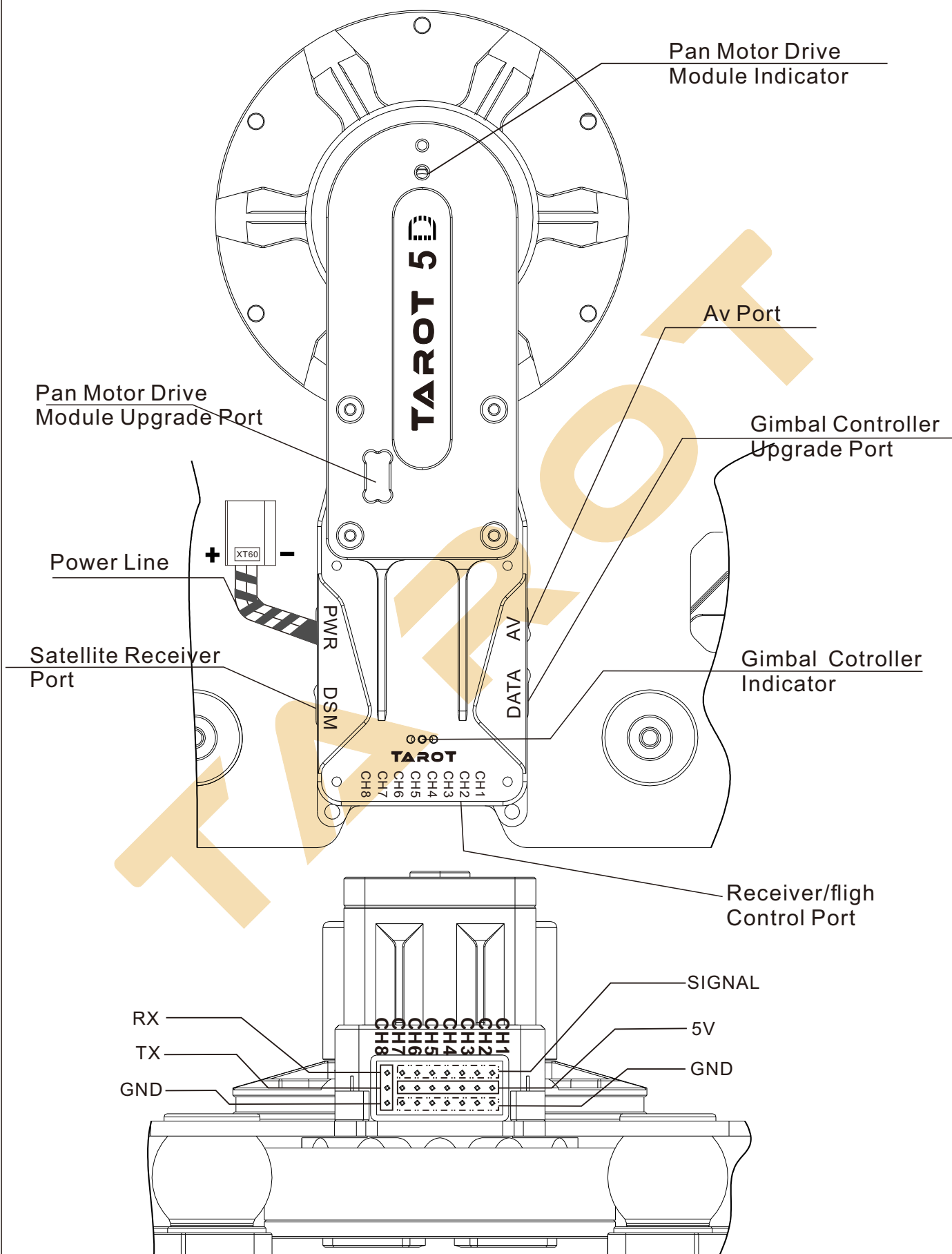
Step One: Solder Power/Video Signal/Ground Cable to the Wireless Video Transmission Module.

Step Two: Connect the other side of the gimbal AV cable to the video signal port of gimbal controller module.

Attention:

- ① Please ensure the wireless video transmission module and gimbal controller module has connected.
- ② Please use the standard AV cable, make sure the solder procedures are correct and the cables are insulated without short circuit.
- ③ Choose an external battery for the transmission module.

5. Gimbal Controller Connection



TIPs:

Battery	Power Supply:3S-6S Li (11V-26V) * If you choose a battery to power up the gimbal and multi-rotor, please make sure this battery meets requirements of both components.
Receiver	1. Common Receiver: connect the corresponding port of common receiver to CH1-CH7 channels of gimbal controller. Set related parameters in RECEIVER TYPE and RC MAPPING in assistant software. 2. FutabaSBUS Receiver/ SBUS-2 Receiver: connect SBUS receiver to CH7 channel of gimbal controller. Set related parameters in RECEIVER TYPE and RC MAPPING in assistant software. 3. Satellite Receiver: connect Satellite receiver to DSM port of gimbal controller. Set related parameters in RECEIVER TYPE and RC MAPPING in assistant software. If binding is not successful in DSM2-1 or DSMX-1, please choose DSM2-2 or DSMX-2 to bind.
Video	Connect the wireless video transmission module to AV port through a 3.5mm AV cable.
Flight Control	Gimbal can work without Tarot Multi-rotor Flight Control Module, but the performance might be influenced: 1. Angle offset might occur when the accelerated state lasts for a long time. 2. In AL Mode, drifts might occur in pan angle due to gyro offset. If you are pursuing a perfect performance, please connect the gimbal and Tarot Multi-rotor Flight Control Module to the CH8 channel of gimbal controller.

6. Gimbal Working Mode

You should select a three-positioned switch in the transmitter for working mode. Please connect the corresponding port of the receiver to any channel of CH1-CH7 channels of the gimbal controller. Set RC MAPPING in the assistant software. For different positions, use endpoint fine tune function to set. Please refer to the MODE Channel section in assistant software for detailed information.

TIPs:

When the **MODE port is unconnected**, the gimbal can only work in the DEFAULT mode. Moreover, during flight, if the MODE is unconnected suddenly, the working mode would remain the same before disconnection. After powering up the gimbal, if **the receiver is unconnected**, it works on DEFAULT MODE.

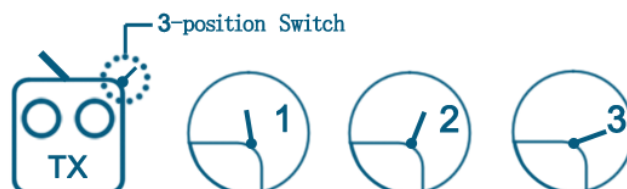
Descriptions:

Working Mode			
Mode	Attitude Lock (AL)Mode	Pan Follow (PF)Mode	First Person View (FPV)Mode
Descriptions	The angles of Roll, Pitch and Pan keep unchanged.	The angles of Roll and Pitch keep unchanged, while the angle of Pan axis changes according to the head of the multi-rotor.	The angles of Roll, Pitch and Pan axis change according to the attitude of the multi-rotor.
Tx Control	Under Control	Under Control	Under Control
Attitude Stability	√	√	√
Vibration Reduction	√	√	√

Working Mode setup:

Choose a three-positioned switch:

Position 1 refers to FPV Mode; Position 2 corresponds to PF Mode; Position 3 corresponds to AL Mode.



Position 1 and Position 3 can be exchanged:

② Choose a two-positioned switch:

Only two working mode is available: please refer to the cursor position of MODE Channel in the assistant software of detailed information.

C.Flight Test

Steps:

1. Please ensure all the wirings are correct and the power supply is in great condition.
2. Turn on the transmitter.
3. Powering up the gimbal and keep it still. After self-check, gimbal angle corresponds to INIT ANGLE in the assistant software.
4. Switch from different working modes to check the rotation direction in ROLL, PITCH, and PAN axis.

TIPs:

Before flight test, please ensure:

1. Correctly mount the camera into the gimbal and the gimbal onto the landing gear.
2. All the wirings are correct.
3. The camera and transmitter have correctly set.

Gimbal Self-check :

1. After powering up the gimbal, it enters self-check procedure. When RED, YELLOW, BLUE lights flash, self-check finishes.
2. After self-check process finishes, gimbal angles corresponds to INIT ANGLE in the assistant software.

D.ZYX-5D Assistant Software

1. Drive & PC Assistant Software Installation and Setup

- ① Please download the assistant software ZYX5D from <http://www.0577mx.com/>
- ② Run the drive program in USB Driver folder and finish the installation procedures step by step. Please **DO NOT** ignore this step!
Windows x86: "CP210xVCPInstaller_x86.exe";
Windows x64: "CP210xVCPInstaller_x64.exe";
- ③ Connect the USB module to the computer, and finish the installation.
- ④ Run the assistant software ZYX5D.EXE and set the parameters.

2. Introduction

ZYX-5D, the three-axis gimbal, could support the camera to stabilize its positions on the roll, tilt and pan axis.

You could adjust receiver type, working mode, angle range and other options in the assistant software.

First of all, please connect gimbal controller to the PC through a USB cable. Choose a correct COM port and click the "Connect".



If the connection is successful, the gimbal would stop rotating to protect your device.

After finish parameters setup, click "Run Gimbal". Push sticks and toggle switches to ensure the gimbal works correctly.

When finish parameters setup, you should click "Write Flash" to ensure all the parameters have written to the gimbal. Moreover, the gimbal will automatically run the parameters you have saved in the flash next time.

3. Basic Setup

The screenshot shows the following menu structure:

- Receiver Type:** Covention
- Default Mode:** FPV
- Control Mode:** Roll (Rate Control), Tilt (Rate Control)
- Max Rotation Speed:** Roll (0), Tilt (0), Pan (0)
- Init Angle:** Roll (0), Tilt (0), Pan (0)
- Angle Limit:** Min/Max for Roll, Tilt, Pan (all 0)
- Motor Torque:** Roll (0), Tilt (0), Pan (0)

Methods to Connect the Receiver:

Common Receiver: respectively connect to CH1-CH7 channel through 3P cables.

SBUS Receiver: Connect to CH7 channel through a 3P cable.

Satellite Receiver: connect to the satellite receiver DSM port.

1. Receiver Unconnected: set gimbal mode in Default Mode of assistant software.

2. Receiver Connected: set gimbal mode in MODE channel of the receiver.

FPV Mode: The direction of the gimbal and directions (roll, tilt and pan) of the multi-rotor are the same.

PFM Mode: The head of the multi-rotor and the gimbal are in the same direction.

AL Mode: The gimbal keeps a fixed angle.

Methods to control gimbal rotation by Tx (roll and tilt only):

Rate Mode: The position of the stick is corresponding to the rotate speed of the gimbal.

Angle Mode: The position of the stick is corresponding to the angle of the gimbal.

Angle Range of Rotation on each Direction of the Gimbal.

If the gimbal rotates to or over the extreme value, it would stop rotating until the value goes within the range.

The Extreme Range of Roll: -25°~25°

The Extreme Range of Tilt: -120°~15°

The Extreme Range of Pan: -125°~125°

Please press "ENTER" button after modifying the parameters.

Init Angle stands for the initial angle of each direction

after the gimbal has been powered up. For instance, if you want the tilt direction of the camera is on -45 degree, you should enter -45 on the corresponding box.

Angle Range of Roll: -25°~25°

Angle Range of Tilt: -120°~15°

Angle Range of Pan: -125°~125°

Please press "ENTER" button after modifying the parameters.

The maximum rotation speed the gimbal can reach.

When pushing sticks to the maximum but the rotation speed is lower, you could increase the value of Max Rotation Speed to enhance the rotation speed;

When pushing sticks gradually but the rotation speed is too fast, you could decrease the value to slow down the speed.

Max Rotation Speed Range of ROLL: 0~200(degree/sec)

Max Rotation Speed Range of TILT: 0~200(degree/sec)

Max Rotation Speed Range of PAN: 0~200(degree/sec)

Please press "ENTER" button after modifying the parameters.

It relates to the response speed of the gimbal. When it becomes too small, the stability deteriorates. When it turns too large, self-oscillation occurs.

Methods to adjust: if vibration occurs, please decrease the parameters until it disappears.

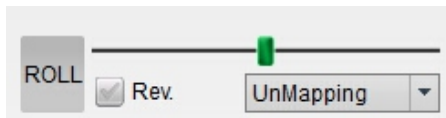
Input Range: 0~200

Please press "ENTER" button after modifying the parameters.

Attention: it has been adjusted to an appropriate value before leaving factory. If vibrations do not occur, please do not modify this value.

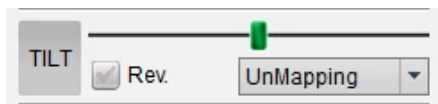
4. Channel Descriptions

(1) Roll Channel



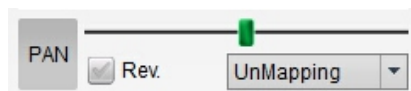
Observe the rotation of the roll axis.
Push the stick, and observe the rotation direction of the gimbal and the moving direction of the cursor.

(2) Tilt Channel



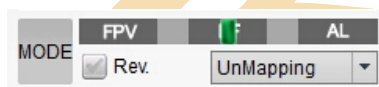
Observe the rotation of the tilt axis.
Push the stick, and observe the rotation direction of the gimbal and the moving direction of the cursor.

(3) Pan Channel



Observe the rotation of the pan axis.
Push the stick, and observe the rotation direction of the gimbal and the moving direction of the cursor.

(4) Mode Channel



This channel controls gimbal working mode. Choose a three-position switch to control the working mode of the gimbal

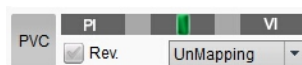
FPV Mode: the direction of the gimbal and directions (roll, tilt and pan) of the multi-rotor are same

PF Mode: the head of the multi-rotor and the gimbal are in the same direction.

AL Mode: keep a fixed angle.

Observe the MODE channel: Toggle the switch to the position, the cursor should be in the corresponding area.

(5) PVC Channel



1. This channel controls the camera to take photos and record. Please choose a three-positioned channel to map to PVC channel.

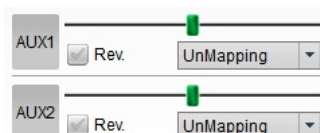
2. Toggle the switch once, the camera would take a photo or start recording.

PI Mode: switch to this mode for one time, the camera would take a photo.

VI Mode: switch to this mode for one time, the camera would start/stop recording.

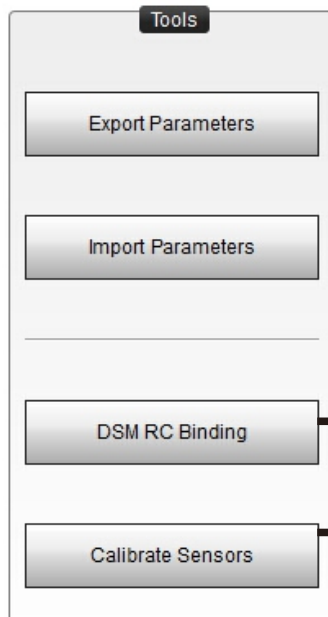
Observe PVC channel Toggle the switch to the position, the cursor should be in the corresponding area.

(6) AUX通道



Reserve Channels

5. Tools



1. Power up the gimbal and correctly connect to the assistant software.
2. Choose a correct receiver type and click "Write Parameters to Flash".
3. Click "DSM RC Binding" button, and the gimbal will stop.
4. Connect Satellite Receiver to the corresponding port. Receiver LEDs will flash.
5. Turn on the Tx to bind.
6. After binding, power cycle the gimbal.

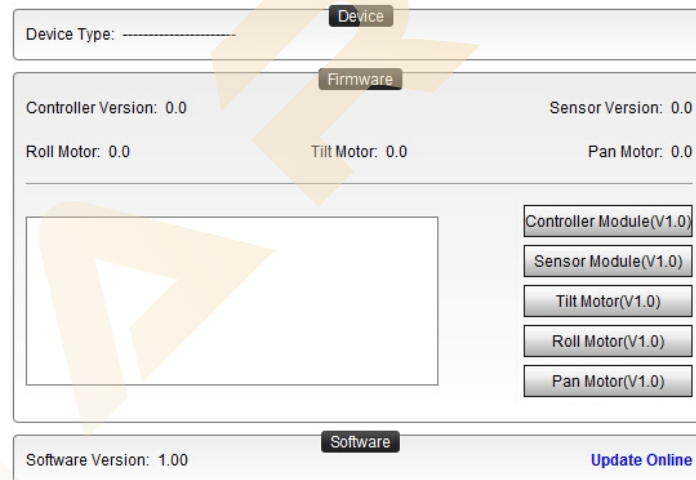
Sensors Calibration

When sensors suffer from squeezing, striking or violent changes of temperature, deviation might occur. In order to avoid drifts and tilting, please calibrate sensors.

Methods to calibrate:

1. Click "Stop Gimbal" button.
2. Keep the gimbal still. This process will affect the final result. Click "Calibrate Sensors" button. Calibration lasts for around 4 seconds.
3. When "Calibration is successful" shows on the left bottom, the calibration procedures finishes.

6. Firmware Upgrade



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Upgrade Procedures:

- (1) Please make sure the connection between controller module and PC, and check whether or not the version of each module can be correctly seen.
- (2) Please connect the module and PC through a USB cable.
- (3) Click the corresponding module for upgrade. Wait until all the procedures have been done.

TIPS:

If there is something wrong during the upgrade, please check the connection of the module, the version of each module version. Ensure the upgrade button has been clicked correctly. You can repeat upgrading for several times until your device is broken.

Please ensure all the modules are in the same version number. Otherwise, gimbal will not work.

Moreover, you could screenshot the upgrade procedures and send your concerns or problems through the feedback on the top right corner of the assistant software.

E.Troubleshooting

Drifts occur in pan axis of AL Mode.	1. Sensor error is too large. 2. Flight control module is unconnected.	1. Calibrate sensors. 2. Connect to flight control module.
Angle is not level.	1. Error of sensors is too large. 2. Tx is not centered.	1. Calibrate sensors. 2. Center the Tx.
Gimbal vibrates.	1. The camera is not screwed down. 2. Motor torque is too large.	1. Screw down the camera and lens screws. 2. Decrease motor torque value slightly.

F.Specifications

Input Power	3S-6S Li (11V-26V)
Working Current	120mA (@25V)
	180mA (@12V)
Stall Current	4000mA (@25V)
	8000mA (@12V)
Working Environment	-20℃~+50℃
Weight	1510 g
Dimensions	215x235x231mm
Max Controllable Rotation Speed	TILT:±200 deg/sec
	ROLL: ±200 deg/sec
	PAN: ±200 deg/sec
Controllable Rotation Range	TILT: -120°~+15°
	ROLL: ±25°
	PAN: ±360° continuous rotation
Attitude Control Accuracy	±0.02°
Supported Camera	Canon Mark 5D III
Supported Lens	Canon EF 17-40mm f/4L USM
Assistant Software Supporting Platform	Windows XP/VISTA/7/8

G.Port Descriptions

GIMBAL CONTROLLER	Functions
PWR	Power Port
DATA	Gimbal Controller Upgrading Port
AV	Video Output Port
DSM	Satellite Receiver Port
CH1	Common Receiver Input Port 1
CH2	Common Receiver Input Port 2
CH3	Common Receiver Input Port 3
CH4	Common Receiver Input Port 4
CH5	Common Receiver Input Port 5
CH6	Common Receiver Input Port 6
CH7	Common Receiver Input Port 7 or SBUS port
CH8	Flight Control Module Connection Port
Motor Drive and Sensor Module	Functions
DATA	Upgrading port

H.LED Indicator

Gimbal Controller	
RED, YELLOW and BLUE lights flash twice.	Self-check process status
RED, YELLOW and BLUE lights are constantly on.	Self-check process fails.
BLUE light flashes slowly.	Work properly
BLUE light flashes quickly.	Bind with Satellite Receiver
BLUE light turns off.	Gimbal stops or stall pauses
YELLOW light is constant on.	Connection to Flight Control Module is normal.
YELLOW light flashes.	Connection to Flight Control Module is normal, and GPS data of Flight Control Module is available.
YELLOW light turns off.	Flight Control Module Unconnected
RED light flashes.	1. Line fault.
	2. Center of gravity of gimbal is incorrect.
	3. Some Module is upgrading.
	4. Stall protection of gimbal is over five times.
MOTOR DRIVE and SENSOR MODULE	
BLUE light flashes for one time.	Self-check status
BLUE light is constant on.	Self-check fails.
BLUE light flashes slowly.	Work properly.
BLUE light flashes quickly.	Line fault or some module is upgrading.